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Let's Spend Some Time Together:
Exploring the Out-of-Box Experience of Technology for Older Adults

Alison Burrows, University of Bristol, Bristol, UK
Val Mitchell, Loughborough University, Loughborough, UK
Colette Nicolle, Loughborough University, Loughborough, UK

ABSTRACT

Designing technology for older people has traditionally focused on compensating for the decline in abilities that occurs with ageing. The research described in this paper followed a more holistic approach, focusing on the broader user experience of technology in the home environment. Specifically, this research was concerned with the very first interactions with a new product known as the Out-of-Box Experience (OoBE): how older people acquire their technology, how they unpack it, and how they set it up. This paper describes two exploratory studies that used a design ethnography approach to build a rich picture of the OoBE of new technology for older adults. The findings indicate that older people experience varying benefits from the involvement of other people during the OoBE of new technology. Lastly, the paper discusses the value of social interaction in this context and offer recommendations on the design of the OoBE of technology to engage older adults.

KEYWORDS

Co-Experience, Inclusive Design, Older Adults, Out-of-Box Experience, Technology, User Experience

INTRODUCTION

The growing ubiquity and capability of technology has fundamentally changed the way we work, the way we form and maintain relationships, and the way we manage our everyday lives. This central role of technology, experienced today and envisaged for the future, is fuelling a concerted effort to achieve widespread digital participation. Given that older adults represent the fastest growing demographic worldwide, this effort has largely focused on making technology appropriate for the ageing population.

Addressing this challenge within the HCI community has traditionally been dominated by a focus on the characteristics that set this age group apart from younger generations, such as the decline in

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their abilities and their inexperience with technology. While this body of work has contributed to establishing a baseline for technology that is accessible and usable for older people, in recent years there has been a noticeable departure from such reductionist approaches (e.g. Lindley et al., 2008; Rogers et al., 2014; Sun et al., 2014). In a review of the literature, Durick et al. (2013) stress the importance of understanding the lived experiences of older people over designing interactive devices that compensate for the assumed needs of this user group. This approach offers a promising pathway to more meaningful and inclusive designs for older people.

With evidence that many of the difficulties that older people experience with computers relate to complicated documentation, too much jargon, and inadequate support for inexperienced users (Goodman et al., 2003; Lindsay et al., 2012), it seems opportune to better understand these initial experiences of technology. User experience design increasingly considers user needs across multiple touchpoints, including discovering, ordering and installation of technology (McCarthy & Wright, 2004). The recent growth of service design as an academic discipline and professional practice reflects this trend (Zomerdijk & Voss, 2010; Sangiorgi & Prendiville, 2014). The research described in this paper was concerned with gaining a contextual understanding of older adults' initial experiences with new technology, which include acquisition, unpacking, set-up, assistance, and first use. This phase, known as the Out-of-Box Experience (OoBE), is critical because it can determine users' acceptance of a new product (McMurtrey, 2001; Gilbert et al., 2005; Serif & Ghinea, 2005) and negatively influence how they perceive manufacturers and service providers (Fouts, 2000; Kowalski 2001).

This paper details two qualitative user studies. The first study aimed to investigate older adults' initial experiences with new technology, using an adaptation of the Technology Biography method (Blythe et al., 2002). Findings from this study indicated that other people were often involved in some or all of the stages of participants' OoBEs. The second study evolved in response to the need to further explore the desire for social interaction during product interaction, and used a combination of cultural probes (Gaver et al., 1999) and semi-structured interviews with a smaller subset of participants from the first study. The research presented in this paper extends HCI research on older people and technology by providing new insights about the context of their OoBEs. By drawing on the combined findings of these studies, the paper provides recommendations to guide the design of OoBEs that support and engage older people to use new technology.

RELATED WORK

Improving technology use by older adults has been approached from different perspectives and, consequently, there are various points of view across the literature. HCI research has been criticised for focusing too narrowly on understanding the barriers experienced by older people regarding technology adoption and use, which has contributed to a stereotyped view that people over a certain age are afraid or unable to use technology (Lindley et al., 2008; Rogers et al., 2014; Sun et al., 2014). In reality, older adults' computer use is influenced by a combination of factors that relate to the person, their behaviour, and the environment (Wagner et al., 2010). For instance, research has focused on the effect of cognitive abilities, attitudinal variables such as self-efficacy and computer anxiety (Czaja et al., 2006), and socio-economic factors such as income and the availability of broadband (McMurtrey et al., 2012). It is important to recognise that older adults are as diverse as any other age group, even though ageing is likely to increase differentiation due to changes in abilities and the effect of life experience (Fisk et al., 2004).

The reasons given by older adults for not taking up technology are varied and complex. Research has found that many people who reported problems using a computer attributed them to complexity and jargon, rather than physical difficulties (Goodman et al., 2003; Morris et al., 2007). This view is echoed by Czaja et al. (2006) who identified the increased complexity of systems and technical manuals as constraints on the adoption of new technology. However, there is evidence to suggest that older individuals are willing to invest in using new technology provided the outcomes are perceived

as obviously beneficial (Melenhorst et al., 2006). This research disproved the idea that reducing costs, such as the investment of time and effort, encourages older adults to use new technology. Even though older adults may see costs as barriers to their use of technology, it is more likely that an absence of benefits is the key disqualifier.

Motivation is a crucial yet largely overlooked factor, given that developers do not always design technology that is relevant to people's lifestyles. In a survey of 1,335 people undertaken by Philips (2004), a commonly held belief was that companies introduce products that they think will sell, often guided by perceived rather than actual consumer needs. In the over 66 age group, none of the participants felt that technology companies researched and truly understood their needs. Furthermore, the ways in which older people make their decision to use or not use digital technologies differs fundamentally to the ways in which younger generations make these decisions (Lindsay et al., 2012). In this context, it seems opportune to heed advice to gain a richer understanding of older people's real life experiences before assuming that more technology is the golden key for this user group (Durick, 2013).

For HCI this has signified a move towards approaching interaction from a phenomenological stance (Harrison et al., 2007). In other words, construction of meaning is fundamental and contingent on the physical and social setting in which the interaction occurs. Shifting the focus from objects and tasks to experiences propels consideration of the user in a broader and more holistic system. This system comprises the user, the product and the context of use, as well as the emotions produced through this interaction. Interplay of these elements can be framed as: experience, which refers to how people "self-talk" everyday occurrences; an experience, which refers to something that can be articulated as having a beginning and an end; and co-experience, which refers to user experience in social contexts (Forlizzi & Battarbee, 2004). Co-experience is the result of creating meaning and emotion with other people, through interaction with products.

The very early interactions with new and unfamiliar technology fall under the OoBE, which begins with acquisition and ends with first use. It is by definition a spontaneous and transitory phase, but one that is destined to be repeated as products need to be replaced. The first step towards creating a good OoBE is to define the intended OoBE for the target users (Kowalski, 2001). For many companies this means unpacking and setting up the new product, to expedite first use. A whitepaper published by the Ease of Use Roundtable contained an analysis of call-centre and usability data that revealed that the most commonly reported problems were set-up and initial configuration, network failure and wireless hardware issues (Intel Corporation et al., 2000). This report also contains a thorough set of guidelines for pre-empting and solving common OoBE problems. These guidelines focus on overcoming specific usability issues, such as making set-up faster and reducing the need for instruction manuals, but overlook the more emotive issues of the OoBE (Intel Corporation et al., 2000).

In concurrence with these recommendations, Ketola (2005) suggests that a good OoBE should explain product features and capabilities, communicate sources of assistance, and give problem solving support in case of difficulty. Interestingly, there is some overlap between these recommendations and those put forward by Melenhorst et al. (2006) in terms of boosting older adults' motivation to take up new technology. Specifically, both suggest that it is essential to clearly communicate the benefits of the product, as well as any problems that may arise. More recently, research has shown the importance of this type of transparency in facilitating positive conditions for older people to learn how to use digital technologies (Barnard et al., 2013).

METHODOLOGY

The purpose of this research was to gather new insights about older adults' experiences with technology, with a view to informing the design of more desirable and successful Out-of-Box Experiences for these products. The research design reflected a desire to take an empathic approach, as well as to gain a holistic view of older people's experiences. The focus was on understanding the

subtleties and complexities of people's practices and, therefore, the adopted approach was informed by design ethnography as described by Bell (2001). The studies were exploratory and conducted 'in the wild', in the participants' homes. A range of methods were selected with a view to eliciting rich and meaningful data, including techniques to allow participants to express their deeper levels of experiential knowledge (Sanders, 2001).

Participant Recruitment

The sample for this research comprised people aged 50 and over. While it is acknowledged that many people in this age group do not view themselves as 'old', this criterion was adopted to reflect the impact of the mass consumer society that grew in the aftermath of World War II, which boosted people's exposure to and consumption of domestic technologies (Gilleard and Higgs, 2008). This Baby Boom generation witnessed the home computer revolution of the 1980s. Moreover, in recent years this cohort began to reach an important life milestone that can affect their relationship with technology, the age of retirement. Participants were segmented into three generation-based cohorts: the Baby Boomers who were mostly still working, aged 50 to 64; people aged 65 to 75, who were retired or entering retirement; and people aged 76 and over. No specific exclusion criteria were used.

Given that the studies would take place in participants' homes, it was anticipated that some degree of familiarity would help to overcome any privacy or trust issues that could arise. Participants for Study One were recruited initially through known networks, followed by snowball sampling that occurred naturally as the study progressed. Data saturation, such that no new insights were arising from the data, was achieved once 24 interviews had been completed.

Participants for Study Two were purposively sampled from the previous study, to include a range of characteristics that were relevant to the research aims and objectives. This decision is consistent with the intention of establishing the sustained engagement endorsed by design ethnography advocates (e.g. Bell, 2001) and design researchers investigating user experience (e.g. Sleeswijk Visser, 2009). While the limitations of these sampling techniques and the number of participants per study are acknowledged, these were deemed acceptable given the exploratory nature of the research and the focus on obtaining rich contextual data.

STUDY ONE

The aim of this study was to gain a contextual understanding of older adults' initial experiences with new interactive products, from acquisition through to first use. Ethical protocols with regard to interviewing older people in their own homes were observed.

Data Collection and Analysis

The Technology Biography method (Blythe et al., 2002) was adapted to suit the purpose of this research. Data collection occurred during a single visit to the participants' homes, and comprised three stages. Firstly, a semi-structured interview focused on participants' feelings about acquiring and using new technology. Participants were then asked to conduct a walking tour of their home to show and discuss the technology present in each room. The researchers were especially interested in participants' most recently acquired, favourite and least favourite technologies, asking similar questions for each example about its OoBE and context of use. Lastly, participants were asked about technology that they would like to own, and what benefits they expected from technology in the future.

All technology biographies were audio-recorded, transcribed and anonymised. The data were inductively coded using thematic analysis (Aronson, 1994). This analysis was ongoing and iterative, so that reflecting on existing data informed subsequent interviews. Data analysis uncovered three overarching themes pertaining to the take up and use of technology by older people: commonalities between older people and their younger counterparts; specificities of older people; and the role of

other people in older people's experiences with technology. The following section focuses on data relating to the role of other people in the OoBE.

Findings

Participants and Their Technology

The 24 participants comprised 12 men and 12 women, divided into three age groups (Table 1). In the 50 to 64 age group, ages ranged from 50 to 60 (M=53.88 and SD=4.16). In the 65 to 75 age group, ages ranged from 65 to 74 (M=66.63 and SD=3.07). All participants in these groups owned and used computers and mobile phones. In the 76 and over group, ages ranged from 77 to 85 (M=81.25 and SD= 2.19). In this group, all but one participant owned or had owned a computer. All participants in this group owned at least one mobile phone per household, occasionally shared with their partner.

Seven participants in the younger age group were still working; in the 65 to 75 age group, half of the participants were retired; in the oldest age group, all participants were retired. A total of 17 people in this sample lived with their partners. All participants had a minimum of post-secondary education, so no attempt was made to determine the impact of level of education on older people's feelings and experiences of new technology. No significant discrepancies were noted between male and female participants' responses.

A number of different types of technology were discussed in this study. The computer was a favourite technology for many participants aged 50 to 64 (7 people) and 65 to 75 (5 people). While less frequently mentioned as a favourite in the oldest age group (3 people), it came a close second to the television (4 people). Favourite technologies were praised for their functionality and what they allowed participants to achieve. Respondents in this study seemed to have a noticeable antipathy towards DVD players (8 in total) but most people (11 in total) did not feel they had a least favourite technology, explaining that they tended to own the type of products they liked to use. A summary of these results is provided in Table 2.

A key theme to arise from this study was the role that other people play in the adoption and use of technology by older people. Specifically, other people provided motivation to take up a new product, they were often involved in the Out-of-Box Experience and, when problems are encountered, they were also part of the coping strategies.

Other People as Motivation

Many participants, in particular in the over 76 age group, described how family and friends swayed their decision to acquire new technology. Even people who reported having high computer anxiety and low self-efficacy beliefs took up new technology when encouraged by family members or friends. For example (male participant, over 76 age group):

I mean the computer, I had a very slow start with the computer but then my granddaughter, who travelled extensively when she was at university, began to feel that it was worthwhile getting involved with the internet because, of course, I could keep in touch with her.

Table 1. Number of participants in Study 1, according to age group and gender

	Male	Female	Total
50-64 years old	3	5	8
65-75 years old	4	4	8
Over 76 years old	5	3	8

Table 2. Technology mentioned for each category by age group

Most Recently Acquired Technology	50 to 64	65 to 75	Over 76
Computer	3	3	2
Mobile phone	2	2	1
DVD player	-	-	2
Television	-	1	-
MP3 player	1	-	-
Digital voice recorder	1	1	-
Digital camera	-	1	-
Set-top box	-	-	1
Music system	-	-	1
Power tools	1	-	-
Kitchen appliance	-	-	1
Favourite Technology			
Computer	7	5	3
Mobile phone	-	-	1
Television	-	2	4
MP3 player	1	-	-
Digital camera	-	1	-
Least Favourite Technology			
Computer	-	-	1
Mobile phone	1	-	-
DVD player	3	3	2
Television	-	-	1
Social networks	1	-	-
Printer	1	-	-

This is consistent with findings from other research that investigated generational differences experienced by older ICT users, which also attributed a significant role to other people in motivating older people's adoption and use of technology (Lim, 2012). More recent research with older people in urban China found that the younger generations are often responsible for introducing their parents to ICT (Sun et al., 2014).

Other People and the Out-of-Box Experience

Participants of all age groups mentioned seeking advice on what product to buy from a third party, such as a relative, a trusted friend, and sometimes from shop assistants. A few participants also explained that this involvement of other people extended to actually buying the technology, online or from a shop. This finding is consistent with a survey by Goodman et al. (2003), which found that only 33% of older people who owned computers had chosen it themselves. The remaining respondents indicated that family or friends had chosen it for them.

Over half of the participants (14 out of 24) said they would avoid unpacking and setting up a new device themselves. Given the choice, participants would rather someone else set the products up for them. One reason given was that other people would set up the product faster and more effectively. This relates to issues of computer anxiety and self-efficacy beliefs, identified in this study and elsewhere in the literature (Czaja et al., 2006; Wagner et al., 2010). A second justification was that the presence of another person gave them an opportunity to learn, by observing the process and asking questions. For example (female participant, 65-75 age group):

When we buy something new, setting it up is something we would normally avoid. Something major like a computer and a television, we would be prepared to pay to have somebody do it so I could ask questions and learn how to use it.

Thirdly, some participants said that acquiring a new technological product provided them with an opportunity to spend time with other people, normally family members. In particular, for older participants living on their own and couples whose children had moved away, the OoBE was a chance to engage in social interaction. This supports the idea that older people who seek co-experience of the OoBE can derive social benefits from this phase of interaction with new technology.

Another theme that arose from this study was the difficulty in understanding and setting up new products. Participants reported that product functions were not always clear and they felt they did not use some products to their full potential. Other people were also a crucial part of older people's coping strategies, providing both technical support and emotional support to overcome frustrations with technology.

Other People as Barriers

A point of tension was identified regarding the involvement of other people in technology adoption and use. In some couples one partner took a more active role regarding technology, while the other was more passive or avoided technology altogether. This theme occurred across the age groups, but was more noticeable in the over 76 age group. One male participant in this age group mentioned how he had used this kind of strategy at work, before retiring:

I had a computer in my office, but I never used it. […] My secretary learnt the computer, so anything I wanted she would find for me. I was lazy, I never learnt because she was always there to do it for me.

This type of attitude did not appear to be gender specific, but rather a reflection of individual personalities and relationship dynamics. To illustrate, another male participant in the over 76 age group said:

I've got a friend who has the most marvellous garden but […] he's just lost his wife and he doesn't know how to use anything – she'd got all his plants listed on the computer, but he doesn't know how to find them.

STUDY 2

The results from the previous study indicated that older people were experiencing various types of social benefits from the OoBE, with other people being key motivators in their adoption and use of technology. In response to a desire to further investigate this issue, the authors conducted a second study to determine what factors influence older people's desire for co-experience.

Data Collection and Analysis

Data were collected using cultural probes (Gaver et al., 1999) and a follow-up semi-structured interview to discuss materials generated through the probes. The probes used in this study comprised four clearly labelled elements: postcards, a social map, a disposable camera, and story sheets. Even though technology use by older adults instigated this study, the probes had a more holistic scope and only some elements referred to technology-related tasks.

The probes were designed to allow people to express themselves creatively on different levels (Sanders & Stappers, 2008), by using each or all of its various elements. The social map comprised six Instrumental Activities of Daily Living (IADLs), some of which necessarily involved technology

(choosing a computer, setting up a computer) and others could be facilitated by technology (cooking, shopping, banking, booking a holiday). By using different coloured stickers, participants could show who else was involved in each activity and how often they were involved (a greater proximity of a sticker to the centre of the map indicated that a person was more frequently involved in that activity). The camera activity also prompted participants to share examples of things that involved other people, such as something they like doing with other people, something they need help doing, something they do with someone else even though they do not need to, and something they like to help other people do. Similarly, the story sheets asked for an example of when participants asked for help even though they did not need it, needed help but did not ask for it, and provided help to someone else.

After the researchers collected and familiarised themselves with the completed probes, they conducted a follow-up interview with the participants in their homes. This semi-structured interview allowed the researchers to make sense of the probe outputs and explore the responses with the participants in further detail.

This study produced a large amount of data in a variety of formats, including interview transcripts, photographs, pictures, and even poems. These data were analysed using affinity diagrams, which have been identified as an effective way for designers to consider the design implications of various types of data-driven insights (Hanington & Martin, 2012). The following section reports on the factors that create a desire for co-experience.

Findings

Nine people took part in this study; four male and five female. The ages of the participants ranged from 52 to 83 years old. Table 3 summarises key demographic information about the participants in this study.

Participants were selected to provide insight into a variety of experiences (e.g. recently widowed, diagnosed with Parkinson's) that might give them very different personal views on dependence-independence. The findings were analysed in relation to the previous study, which provided specific examples of experiences related to acquiring and setting up new technologies.

Table 3. Characteristics of participants in Study 2

	Age	Gender	Employment	Marital Status	Living Arrangements	Health
P01	67	Female	Retired (school director)	Widowed	Alone	—
P02	52	Female	Teacher	Married	With partner	Breast cancer survivor
P03	83	Male	Retired (schoolmaster)	Widowed	Alone	Age-related visual and hearing decline
P04	62	Female	Translator	Married	With partner	—
P05	81	Female	Retired (teacher)	Married	Alone	—
P06	66	Male	Professor	Married	With partner	—
P07	52	Male	Retired (teacher)	Married	With partner	Cancer survivor
P08	60	Female	Retired (teacher)	Divorced	Alone	Early stage Parkinson's
P09	76	Male	Part-time Consultant	Married	With partner	Early stage Parkinson's

Exploring the Desire for Co-Experience

Analysis of factors that influence people's desire to delegate tasks or share activities with others revealed ten themes across the study elements. These were grouped into three main categories, which were task-related, social, and psychological (Table 4).

Some activities are social by nature and others are more of an individual pursuit. This was evident from the results of the camera prompts for 'something I like doing with other people' and 'something I like doing alone', with eating and drinking being a common example of the former (3 instances), and reading being a common example of the latter (3 instances). In the follow-up interview, participants mentioned fun and keeping other people company as strong motivators for actively seeking co-experience.

Often the social benefits of co-experience were reciprocal, a topic explored through discussion of the social maps, examples from the story sheets of a time when participants provided help to someone else, and various photos. Reciprocal actions were empowering experiences for participants in this study and, to some extent, mitigated feelings of guilt that could arise from asking people for help. For example, P08 explained how, as a result of Parkinson's disease, she needed to ask her father for help with the gardening. However, she was quite happy with this arrangement because she felt both she and her father gained benefits from the interaction. In her words:

It's nice to do it with dad, because he knows infinitely more than I do about gardening. And also, it makes dad feel good as well, I think.

There were a number of psychological reasons given for involving other people in certain activities. Photos taken as examples of 'something I do with someone else even though I do not need to' (e.g. using a ladder) confirmed findings of Study One that co-experience can provide reassurance. During discussion of the story sheets, P03 explained his example of a time he asked for help even though he did not need it:

I don't trust myself anymore, making any financial decisions. It usually turns out that what I was going to do was alright, but I'm not sure of myself.

Sometimes involving other people in certain activities relates to fulfilling the task in the most effective and quickest way possible, which was also mentioned in the previous study. To illustrate, P07 explained his usual way of dealing with computer problems:

Laziness is one, I'd have thought. If I'm at home working on the computer and (my wife) asks me, I'll sort it out. If (my son) is here and I get stuck on something, I won't battle it.

Encouragement motivates people to do things for themselves, which is relevant to the topic of technology adoption by older adults. In this study the importance of encouragement was most evident

Table 4. Reasons for seeking co-experience

Task-Related	Social	Psychological
• Effectiveness • Time efficiency	• Reciprocity • Keep others company • Fun	• Learning • Reassurance • Encouragement • Trust • Laziness

in conversations about taking classes and doing exercise. P09 explained the benefits he experienced from taking a Pilates class and how he had encouraged a fellow Parkinson's sufferer to join:

When you're encouraged to join a group, you're in the same boat. "Ooh, that hurts!" you laugh about it and that is the benefit you get from the social contact.

Trust emerged as a theme that justified why some participants sought help from people, rather than using technology or doing something online. This was true for P05 (interview), whose Social Map revealed that she did shop online but preferred to book her holidays over the phone:

I always book holidays over the phone, so I've got somebody to talk to and ask about...I'd never be convinced that it had actually gone through online. I wouldn't trust it, I'd rather speak to somebody.

RECOMMENDATIONS FOR THE OOBE

Understanding the benefits experienced by older people when they involve others in certain activities means designers can create new products and services that foster social interaction and are, therefore, more desirable. Some benefits, such as learning, reassurance and encouragement, may actually boost the inclusivity of products and services by supporting new users in overcoming potential or perceived barriers. Based on the results of the studies presented in this paper, the authors offer the following recommendations to researchers and organisations who wish to design more engaging OoBEs for older people.

Explain Benefits and be Honest about Potential Difficulties

If older people feel the benefits of technology outweigh the costs, most will invest the time and effort necessary to take up an unfamiliar product (Melenhorst et al., 2006). As a person's first experience of a new product, the OoBE has the potential to clearly communicate and emphasise its benefits, in particular those concerning older people's lifestyles and aspirations. Likewise, older people should be able to pre-empt any potential problems encountered (Barnard et al., 2013).

Design in Strategies for Co-Experience

This paper established that older adults may experience various types of benefits from co-experience of the OoBE, with other people being key motivators in their adoption and use of technology. An improved user experience through the inclusion of strategies that facilitate this co-experience could generate more desirable OoBEs. These strategies could address some of the contextual needs of older adults, for example by supporting learning, reassurance and encouragement to use new and unfamiliar technology.

But Make Them Optional

It is fundamental for an older person to be able to perform key ADLs and IADLs. One point of tension of co-experience that emerged in Study One was that the presence of people who are more technology-confident can hinder technology adoption by older people. Furthermore, the authors acknowledge that it is not always feasible or desirable to rely on others and people in these circumstances must not be excluded from the OoBE. The way to achieve a balance between inclusive design and designing for co-experience is to make the strategies that facilitate social interaction an optional component of the OoBE. This means that the OoBE can be undertaken individually, whether by choice or necessity, yet it may also encourage co-experience. Overall, the most important characteristic for the OoBE is to allow the user to make choices about how and how much they are involved in the process.

Facilitate Reciprocity

Social interaction was a natural and desirable by-product of the OoBE of technology for older adults, which was sometimes due to computer anxiety and low self-efficacy beliefs. This research found that interaction with other people provided participants with several benefits and, when these benefits were reciprocal, they felt empowered and potential feelings of guilt for needing help were mitigated. Examples of mechanisms that foster reciprocity during the OoBE could include thank you notes, vouchers and other rewards for people who helped set up a new product or service, potentially provided as part of the service design.

FUTURE WORK

This research established the importance of co-experience during the OoBE of technology for older adults. The study samples were reasonably small and comprised only British participants, though there is evidence elsewhere that other people play an important role in technology adoption by older people (Lim, 2012; Sun et al., 2014). It would therefore be interesting to investigate whether the benefits of co-experience extend to a wider population. Future research could focus on older adults with different socio-demographic characteristics, such as level of education or cultural background. Another line of enquiry could focus on understanding what types of product- and service-interactions are improved through designing in social benefits, and which ones are not.

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Alison Burrows is a post-doctoral researcher in User-Centred Design for the SPHERE project, based at the University of Bristol. Her role involves collaborating with other researchers across SPHERE, advising and assisting them to apply user-centred and participatory design methods, to help deliver healthcare technology that is appropriate and desirable to the stakeholders.

Val Mitchell is a senior lecturer at Loughborough Design School and Programme Director for the Interaction Design MA. She specialises in User Centred Design (UCD) and in particular methods for eliciting user requirements for future technologies and services. She is particularly interested in the design and use of scenario and persona based methods within User Experience (UX) design and the development of Participatory and Co-design methods. For more information visit http://www.lboro.ac.uk/departments/lds/staff/dr-val-mitchell.html.

Colette Nicolle is a Senior Lecturer and Research Fellow at the Design School, Loughborough University. She is a Fellow of the Chartered Institute of Ergonomics and Human Factors, member of ANEC's Design for All Working Group and their representative on CEN TC 122 'Ergonomics'. Her applied research, teaching and student supervision focus on inclusive design, ageing and disability in a range of application areas.